



U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Admin.  
NATIONAL OCEAN SERVICE  
Damage Assessment Center  
Florida Keys National Marine Sanctuary

**DATE:** 09/26/01

**TO:** Sharon Shutler and Martin Hindel, NOAA General Counsel  
Maureen Malvern and Mara Tickett, Florida DEP Office of General Counsel

**FROM:** Kevin Kirsch and Sean Meehan, NOAA Damage Assessment Center, Florida  
Keys National Marine Sanctuary

**SUBJECT:** *Julia Reanne* vessel grounding assessment report

**FFWCC INCIDENT (CASE) #:** 01-3A-12272

**FFWCC CITATION:** 011206B

**NAME & DESCRIPTION OF VESSEL:** *Julia Reanne*, 72' steel hull trawler

**VESSEL OPERATOR:** Cory Wayne Goodin

**DATE AND TIME OF INCIDENT:** 8/11/01 @ 2200 hrs.

**LOCATION OF INJURY:** Middle Ground, Northwest Ship Channel (Key West, FL; State of FL waters)

**LAT/LONG POSITION:** N 024° 34.6685' W 081° 50.0893' (east blowhole)  
N 024° 34.6640' W 081° 50.0924' (west blowhole)  
N 024° 34.6796' W 081° 50.0978' (beginning of west injury leading to blowhole)

**TOTAL AREA IMPACTED:**

162.53 m<sup>2</sup> seagrass bottom cover excavated  
30.54 m<sup>2</sup> seagrass bottom cover buried  
193.07 m<sup>2</sup> seagrass bottom cover impacted (predominately *Thalassia testudinum*)

**PHOTO/VIDEO DOCUMENTATION:**

Underwater digital video

**DISCUSSION:** On 08/13/01 Kevin Kirsch and Sean Meehan initiated an injury assessment of the grounding site of the 72' steel hull trawler *Julia Reanne* (see Figures 1 & 2). However, due to inclement weather, the assessment was unable to be completed. A return visit was made the following day to complete the assessment. This grounding occurred on the Middle Grounds in the Northwest Ship Channel west of Key West, FL (See NOAA Chart # 11445). GPS Lat/Long coordinates were taken at several points within the injury.

## **METHODOLOGIES**

Utilizing differentially corrected, surveying-grade DGPS equipment (Trimble® Pro XR with a TSC1 Datalogger), the grounding site was mapped by physically tracing the outlines of the various injury features. The coordinates generated by the tracing work were downloaded to GPS Pathfinder® Office data processing software version 2.70 (Trimble) and then to Arcview® GIS version 3.2a (ESRI), which is used to arrive at square meter area calculations for the injury features. Depth measurements were made by passing an inflatable 8' boat back and forth over the injury equipped with a Garmin® 185 Depth Sounder integrated with a Trimble® Pro XR DGPS mounted on the stern. Depth readings taken by the Garmin are incorporated with differentially corrected positions taken by the Trimble. This information is then processed using Arcview® GIS version 3.2a with the 3D Analyst Extension resulting in a 3 dimensional view of the area. Measurements were made using the water surface as the level plane.

Community composition, percent cover and density of the benthic community, both in the injured area and in the surrounding undisturbed area, were assessed using a modified Braun-Blanquet technique (Kenworthy and Schwarzhild, 1997; Braun-Blanquet, 1932). This method involves placement of a 0.25m<sup>2</sup> quadrat on the substrate and visually inspecting the content of the quadrat. The submerged aquatic vegetation (seagrass and macroalgae) and/or coral are identified and assigned a cover-abundance scale value. The scale values are: 0.0 = not present, 0.1=solitary specimen, 0.5=few with small cover, 1=numerous but less than 5% cover, 2=5-25% cover, 3=25-50% cover, 4=50-75% cover, and 5=75-100% cover. In order to determine the percent cover per individual species, as well as the total seagrass cover, the Braun-Blanquet scores by species and total cover are averaged over all of the quadrats assessed within each feature (injured area, undisturbed area). The point estimates of percentage cover corresponding to these average Braun-Blanquet scores are then calculated using the attached conversion table (see Appendix A). The loss of percent cover of seagrass as a result of the grounding can then be assessed by comparing the percent cover of the injured area to that of the undisturbed area immediately adjacent to the injury.

## **DESCRIPTION OF INJURY**

This grounding occurred on a seagrass bank characterized as a *Thalassia testudinum* dominated seagrass community. Other living components include sponges and other invertebrates typical of seagrass meadows in this area of the FKNMS, various species of macroalgae, and numerous species of fishes. The sediments consist of cohesive carbonate sands and muds, and *Halimeda* algae fragments.

The grounding consisted of two excavation injuries and two berms (see Figure 3). The east excavation injury was composed of a 7.8-meter long track at a bearing 148° leading into a large blowhole. This blowhole had a maximum depth below the surrounding seafloor of 2.0 meters

(see Figure 4). On the south end of the blowhole, the injury continued as a bow/keel scar extended 4.23 meters with an average width of 0.52 meters at a bearing of 158° into the grass bed (see Figure 5). The total east injury resulted in an excavation of 113.97 m<sup>2</sup> of seagrass bottom cover. The ejected material from this blowhole created two berms to the south and southeast. The south berm covered an area of seagrass bottom cover of 17.17 m<sup>2</sup>. The southeast berm covered an area of seagrass bottom cover of 13.37 m<sup>2</sup>. The west excavation injury was composed of a 33-meter long track leading to a blowhole. The blowhole had a maximum depth below the surrounding seafloor of 2.2 meters. Extending from the southern tip of the blowhole, a keel/bow scar progressed 11.95 meters with an average width of 0.45 meters into the grassbed at a bearing of 170° (see Figure 6). The total west injury resulted in an excavation of 48.56 m<sup>2</sup> of seagrass bottom cover. The total volume of seafloor disrupted is calculated to be 77.91 m<sup>3</sup>.

**The total area impacted is calculated to be 193.07 m<sup>2</sup> of seagrass bottom cover, predominately *Thalassia testudinum* (Turtle grass).**

Using the Braun-Blanquet technique, no species of seagrass were noted within the injury caused by the *Julia Reanne* (see Table 1). In the surrounding undisturbed areas, only one species of seagrass was found (see Table 2). The dominant seagrass in this area is *Thalassia testudinum* (Turtle grass) with an average percent cover of 26.25%.

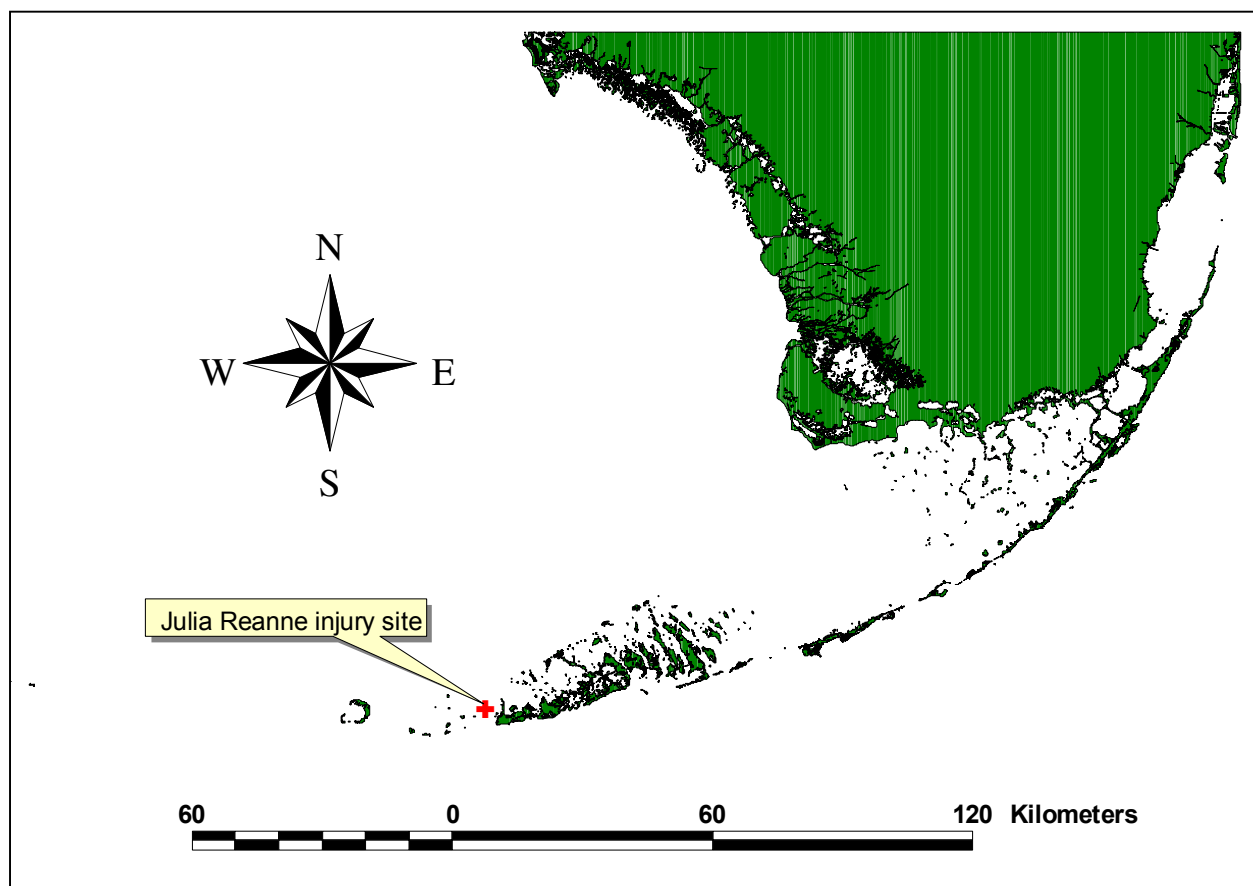
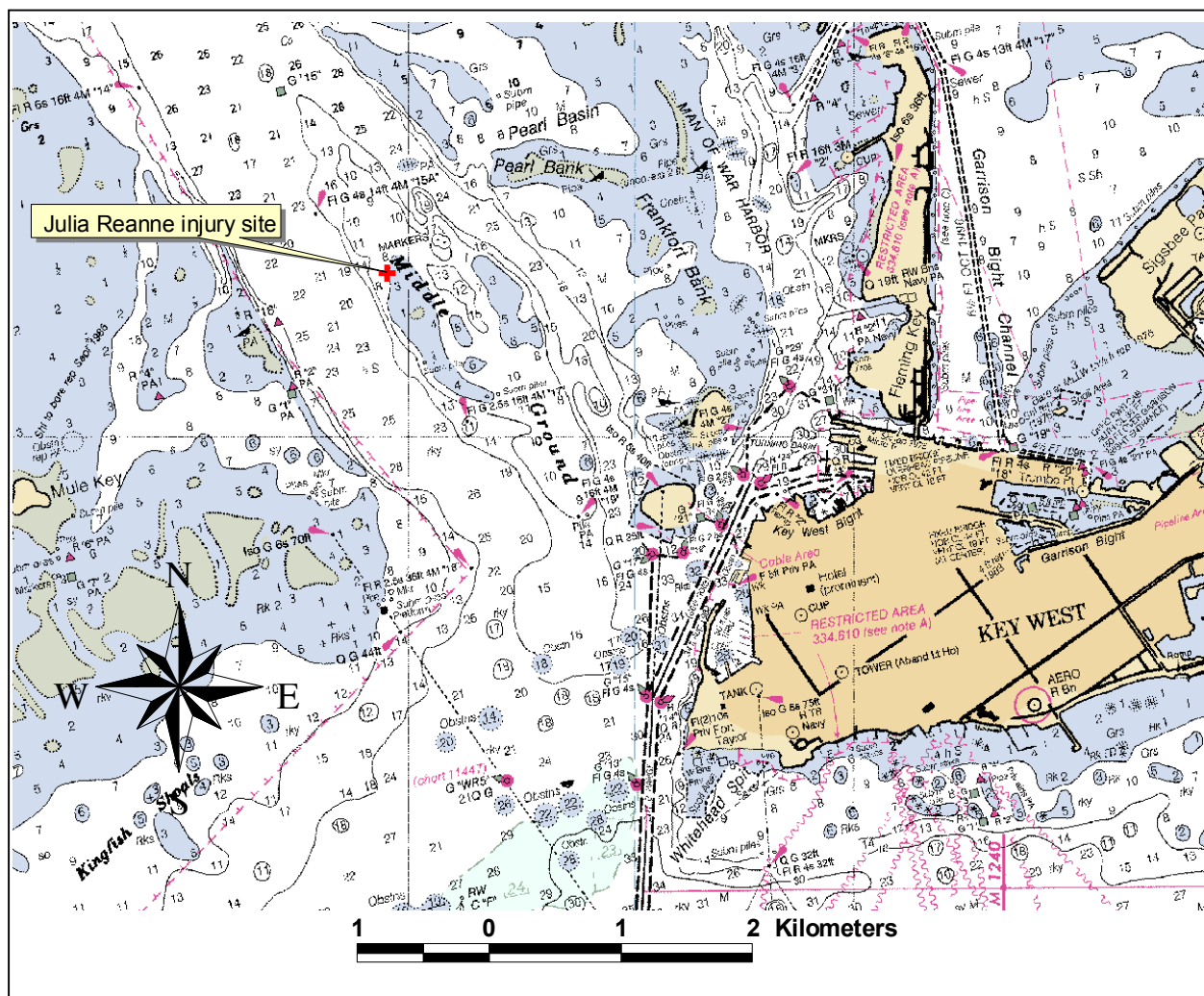


Figure 1. Location of the *Julia Reanne* injury site



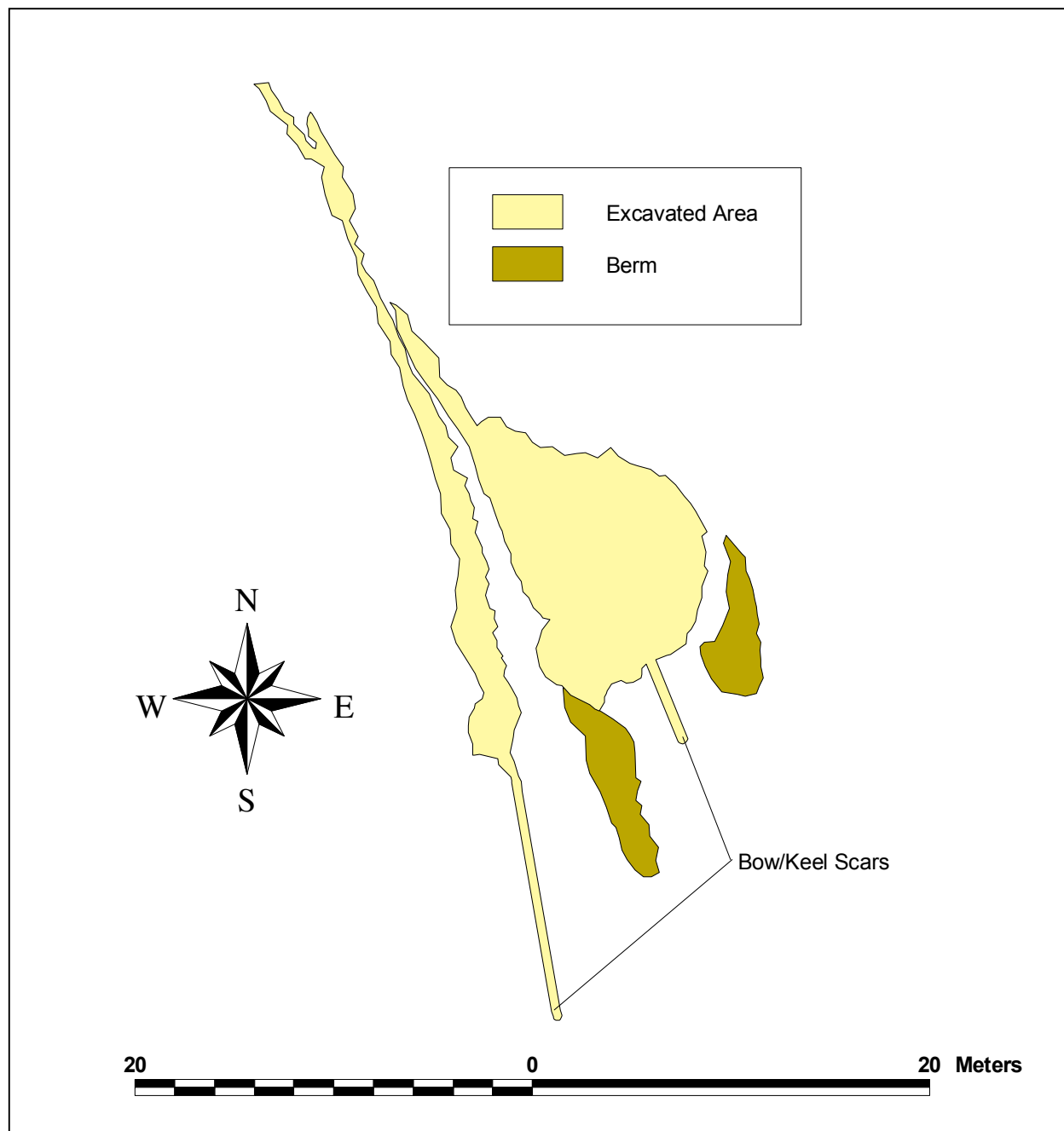


Figure 3. Physical dimensions of the *Julia Reanne* injury.

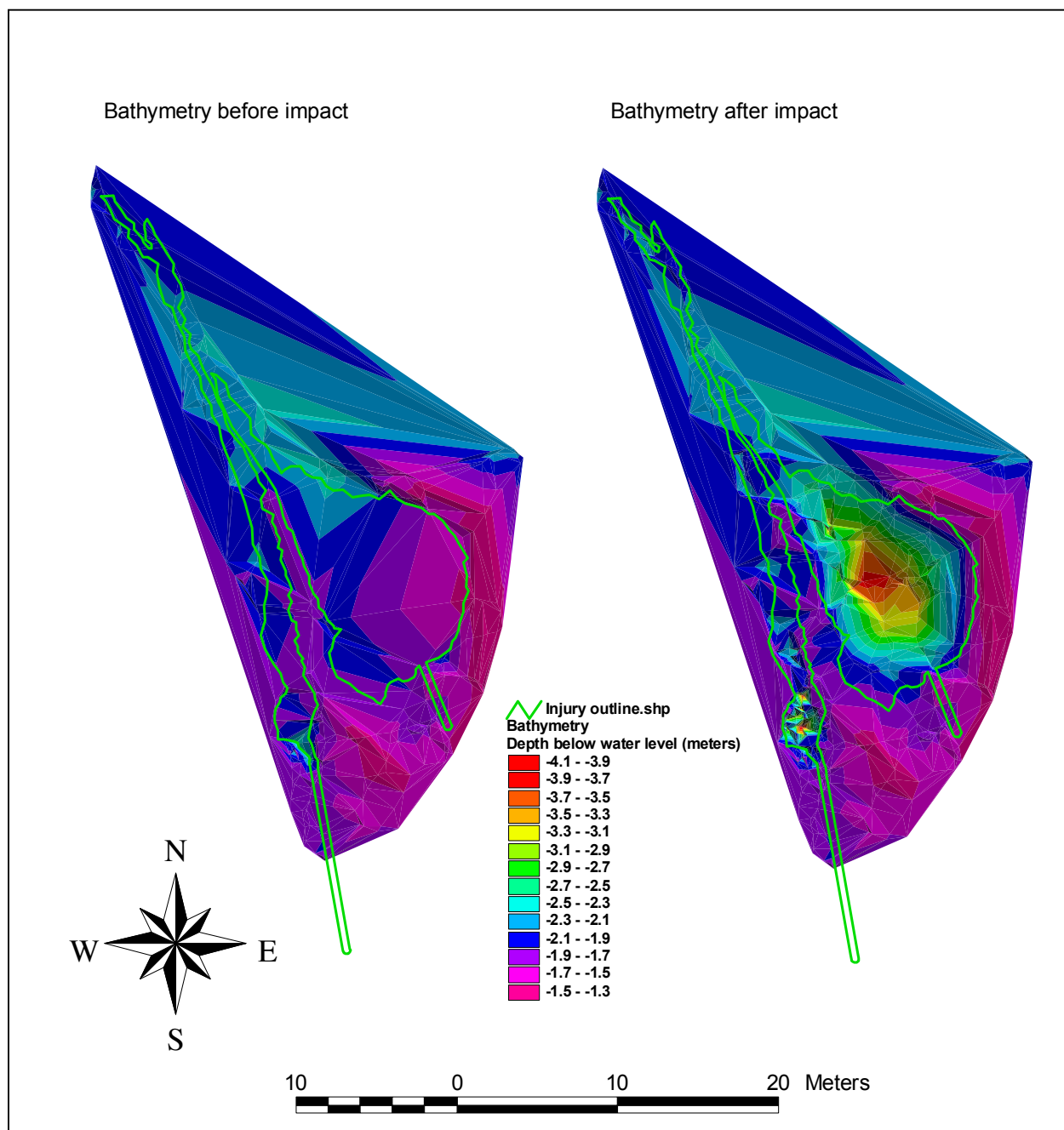


Figure 4. Bathymetry of *Julia Reanne* injury site before and after impact. Before image is calculated based on the surrounding undisturbed seafloor.





Figure 5. Photo of east keel scar, facing south.



Figure 6. Photo of west keel scar, facing south.

Table 1. Summary of Raw Braun-Blanquet Scores (See Braun- Blanquet scores in Appendix B)

Density <sup>1</sup>	Species	Trench Scar	Berm Scar	Control
	<i>T. testudinum</i>	0.0	0.0	2.5
	<i>H. wrightii</i>	0.0	0.0	0.0
	<i>S. filiforme</i>	0.0	0.0	0.0

1) Density =  $D_i = \text{SUM} (S_{ij}/n)$

$D_i$  = density of species i

j = quadrat number

$S_{ij}$  = BB score for species i in quadrat j

n = total number of quadrats in transect

Table 2. Braun - Blanquet Scores converted into percent cover. (See Conversion Table in Appendix C)

Percent Cover	Species	Inside Injury	Surrounding Habitat
	<i>T. testudinum</i>	0.0%	26.25%
	<i>H. wrightii</i>	0.0%	0.0%
	<i>S. filiforme</i>	0.0%	0.0%
	<b>TOTAL</b>		<b>26.25%</b>

## REFERENCES

Braun-Blanquet, J. 1932. *Plant Sociology*- the study of plant communities. G.B Fuller and H.S Conrad, Eds. Koeltz Scientific Books. Koenigstein. West Germany.

Kenworthy W.J. and A. Schwarzhild. 1997. Vertical growth and short shoot demography in *Syringodium filiforme* in outer Florida Bay, USA. Marine Ecology Progress Series. vol 173. pp. 25- 37.



## Appendix A: *Julia Reanne*: Braun Blanquet Damage Assessment and Habitat Characterization

**Percent Cover and Services Lost**

Species	Category	Aboveground percent of total per species in Control Site	Percent Cover in Control Site	Percent Cover Remaining in Trench Scar	Percent of Services Lost in Trench Scar	Percent Cover Remaining in Berm Scar	Percent of Services Lost in Berm Scar
<i>T. testudinum</i>	Density	100.00%	26.25%	0.00%	26.25%	0.00%	26.25%
<i>H. wrightii</i>	Density	0.00%	0%	0.00%	0.00%	0.00%	0.00%
<i>S. filiforme</i>	Density	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total		100.00%	<b>26.25%</b>				

**Average Braun Blanquet Scores**

Species	Category	Trench Scar	Berm Scar	Control
<i>T. testudinum</i>	Density	0.0	0.0	2.5
<i>H. wrightii</i>	Density	0.0	0.0	0.0
<i>S. filiforme</i>	Density	0.0	0.0	0.0

Prepared by: **NOAA Damage Assessment Center, Marathon, FL**

## Appendix B: *Julia Reanne* - Blanquet Scores

Quad #	Injury	<i>T.t.</i>	<i>S.f.</i>	<i>H.w.</i>	Total Grass	TMA	Coral	Sed. Type
1	C	3	0	0	3	2	0	MS
2	C	3	0	0	3	1	0	MS/CS
3	C	2	0	0	2	1	0	MS/CS
4	C	2	0	0	2	3	0	HH/S
5	C	2	0	0	2	2	0	S
6	C	3	0	0	3	2	0	
7	C	3	0	0	3	1	0	CR
8	C	2	0	0	2	2	0	CS/MS
<b>Average</b>		<b>2.50</b>	<b>0</b>	<b>0</b>	<b>2.50</b>	<b>1.75</b>	<b>0</b>	
9	BH	0	0	0	0	0	0	M/CS
10	BH	0	0	0	0	0	0	M/S/CS
11	BH	0	0	0	0	0	0	M/CS
12	BH	0	0	0	0	0	0	S/CS
13	BH	0	0	0	0	0	0	S/CS/M
14	BH	0	0	0	0	0	0	M/CS
15	BH	0	0	0	0	0	0	M/CS
<b>Average</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
16	BM	0	0	0	0	0	0	CR
17	BM	0	0	0	0	0	0	CR
<b>Average</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
18	TR	0	0	0	0	0	0	M/CS
19	TR	0	0	0	0	0	0	M/CS
20	TR	0	0	0	0	0	0	
<b>Average</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

### KEY TO ABBREVIATIONS

#### Species:

*T.t.* = *Thalassia testudinum*

*S.f.* = *Syringodium filiforme*

*H.w.* = *Halodule wrightii*

TMA = Total Macroalgae

#### Sediment Types:

LC = Live Coral

MS = Muddy Sand

SM = Sandy Mud

R = Rock

M= Mud

CS = Coarse Shell

HH = Halimeda Hash

R = Rubble

#### Injury Regions:

TR = Trench

BH = Blow Hole

BM = Berm

C = Control (Reference)

## Appendix C: Braun-Blanquet Score to Percent Cover Conversion Tables

Interpolation of the Mid-Point of BB Scores			
BB Score	% Cover	BB Score	% Cover
0.00	0.00%	2.60	28.50%
0.10	1.00%	2.70	30.75%
0.20	1.00%	2.80	33.00%
0.30	1.00%	2.90	35.25%
0.40	1.00%	3.00	37.50%
0.50	1.00%	3.10	40.00%
0.60	1.00%	3.20	42.50%
0.70	1.00%	3.30	45.00%
0.80	1.00%	3.40	47.50%
0.90	1.00%	3.50	50.00%
1.00	2.50%	3.60	52.50%
1.10	3.75%	3.70	55.00%
1.20	5.00%	3.80	57.50%
1.30	6.25%	3.90	60.00%
1.40	7.50%	4.00	62.50%
1.50	8.75%	4.10	65.00%
1.60	10.00%	4.20	67.50%
1.70	11.25%	4.30	70.00%
1.80	12.50%	4.40	72.50%
1.90	13.75%	4.50	75.00%
2.00	15.00%	4.60	77.50%
2.10	17.25%	4.70	80.00%
2.20	19.50%	4.80	82.50%
2.30	21.75%	4.90	85.00%
2.40	24.00%	5.00	87.50%
2.50	26.25%		

BB Score	Mid-Point Range
<1= <1%	<1= 1%
1=1%-5%	1=2.5%
2= 5%-25%	2=15%
3= 25%-50%	3=37.5%
4= 50%-75%	4=62.5%
5= 75%-100%	5=87.5%